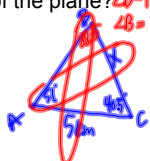
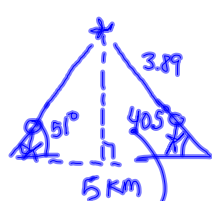


5.10 Applications of Trigonometry

Ex.1. Two observers who are 5 km apart. At the same time, they see a small airplane flying above and between them. One observer measures a 51° angle of inclination (elevation), while the other measures a 40.5° inclination angle. What is the altitude of the plane?



$$\frac{x}{\sin 51} = \frac{5}{\sin 88.5}$$

$$x = \frac{5 \sin 9}{\sin 88.5}$$

$$x \approx 3.89$$

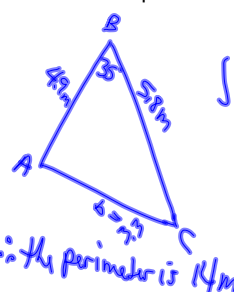
$$\sin \theta = \frac{O}{H}$$

$$\sin 40.5 = \frac{h}{3.89}$$

\therefore the height of the plane is 2.52 km $h \approx 2.52$

Ex.2

Shannon works for a landscaping business. Her job is to measure properties. For a triangular piece of land, two sides measure 4.9 m and 5.8 m and meet at a common point separated by a 35° angle. Find the total perimeter of the piece of land.

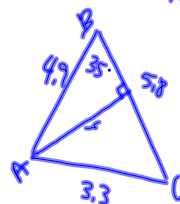


$$b^2 = 4.9^2 + 5.8^2 - 2(4.9)(5.8)\cos 35^\circ$$

$$b = 3.33$$

$$\text{Perimeter} = 3.3 + 5.8 + 4.9 = 14$$

\therefore the perimeter is 14 m



\therefore the area of the triangle is 9.12 m²

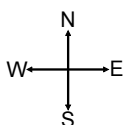
$$\text{Area} = \frac{b \times h}{2} \quad \left\{ \begin{array}{l} \sin 35 = \frac{h}{4.9} \\ h = 4.9 \sin 35 \\ h = 2.8 \end{array} \right.$$

$$= \frac{5.8 \times 2.8}{2}$$

$$= 8.12$$

Compass Directions & Bearings

(a) A compass direction is measured from N, S, E, or W. The angles are always between 0° and 90° .



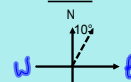
(b) A bearing is always measured from north, in a clockwise direction. The values are from 000 to 360 (but less than 360).



Compass Direction Bearing Path

N10°E

010



N40°W

320



SW

225



Assigned Work:

p.450 # 4 (see Ex.2 p.447), 9 (see Ex.1 p.446)
p.450 # 5, 8, 11, 13, 15

Extra Word Problems - Handout

Next class is a review period.

Review Questions:

p.416 #2, 3, 5, 6, 9, 13, 14, 16
p.453 #2, 3, 7, 8, 11, 12